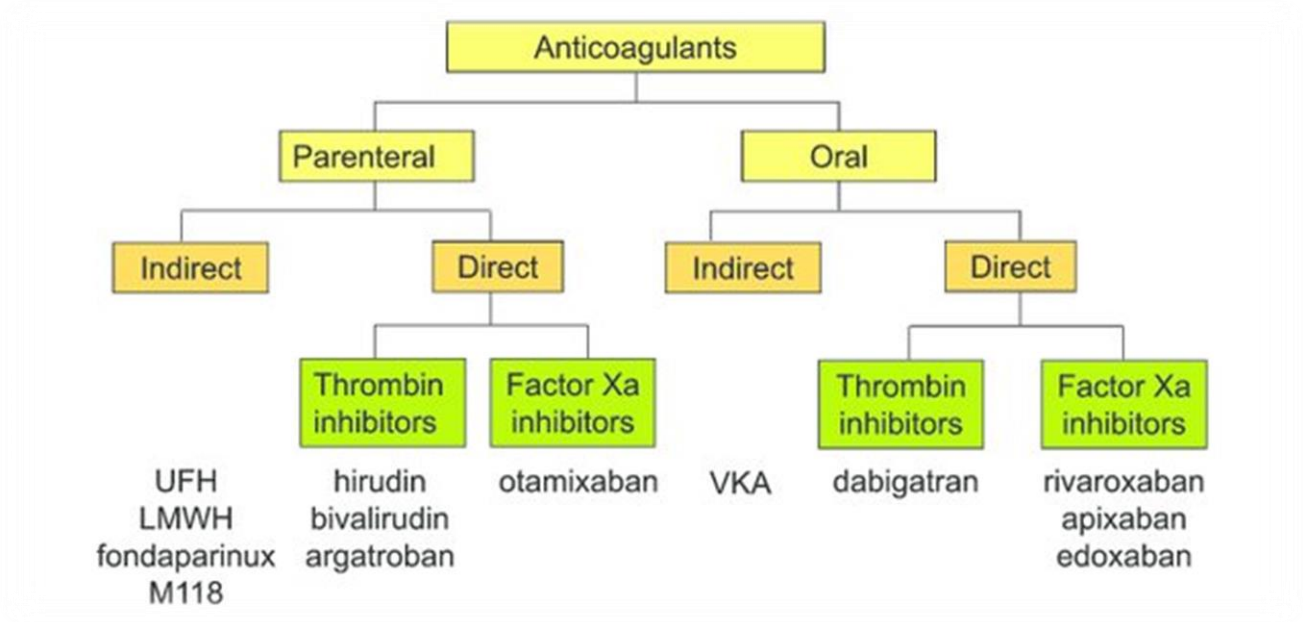


Anticoagulants Classification

1. Parenteral Anticoagulants

A. Indirect Anticoagulants

1. Unfractionated Heparin (UFH)

- **Indications**:
  - Treatment and prevention of venous thromboembolism (VTE)
  - Acute coronary syndrome (ACS)
  - Dialysis
- **Contraindications**:
  - Active bleeding
  - Severe thrombocytopenia (low platelet count)
  - History of heparin-induced thrombocytopenia (HIT)
- **Notes**:
  - Requires monitoring with activated partial thromboplastin time (aPTT).

    - Rapid onset and reversal possible with protamine sulfate.

2. Low Molecular Weight Heparins (LMWH)

- **Examples**: Enoxaparin (Lovenox), Dalteparin (Fragmin)
- **Indications**:
    - Treatment of deep vein thrombosis (DVT) and pulmonary embolism (PE)
    - Prophylaxis in patients undergoing surgery or immobility
    - Managing ACS
- **Contraindications**:
    - Active bleeding
    - Severe renal impairment (caution with dosages)
    - History of HIT
- **Notes**:
    - More predictable anticoagulant response than UFH.
    - Usually does not require routine monitoring.

3. Fondaparinux

- **Indications**:
    - Prophylaxis of DVT in post-surgical patients
    - Treatment of DVT and PE (in combination with warfarin)
    - Acute coronary syndrome
- **Contraindications**:
    - Active bleeding
    - Severe renal impairment
    - Body weight < 50 kg (caution due to risk of insufficient dosing)
- **Notes**:
    - Does not require monitoring.
    - Reversal is challenging; usually only supportive measures.

B. Direct Anticoagulants

1. Thrombin Inhibitors

- **Examples**: Bivalirudin, Dabitran, Argatroban
- **Indications**:
    - Bivalirudin: Used in percutaneous coronary interventions (PCI).

    - Argatroban: Used in patients with HIT or those undergoing PCI.
- **Contraindications**:
    - Active bleeding
    - Severe renal impairment (particularly with dabigatran)
- **Notes**:
    - Bivalirudin has a low risk of bleeding compared to UFH.

2. Factor Xa Inhibitors

- **Example**: Otamixaban (investigational), Edoxaban, Rivaroxaban, Apixaban
- **Indications**:
    - Rivaroxaban and Apixaban: Prevention and treatment of DVT and PE, stroke prevention in atrial fibrillation.
    - Edoxaban: Similar indications as above.
    - Otamixaban: Under study for ACS.
- **Contraindications**:
    - Active bleeding
    - Severe renal disease (caution advised with all except when dosing is adjusted)
- **Notes**:
    - Minimal/no need for monitoring.
    - No specific reversal agent for most; however, Andexanet alfa is available for factor Xa inhibitors.

2. Oral Anticoagulants

A. Indirect Anticoagulants

1. Vitamin K Antagonists (VKAs)

- **Example**: Warfarin (Coumadin)
- **Indications**:
    - Atrial fibrillation (AF) to prevent stroke
    - Treatment and prophylaxis of DVT and PE
    - Mechanical heart valve management
- **Contraindications**:
    - Active bleeding

    - Pregnancy (can cause teratogenic effects)
- **Notes**:
    - Requires regular INR monitoring.
    - Affected by dietary vitamin K; patients need dietary counseling.

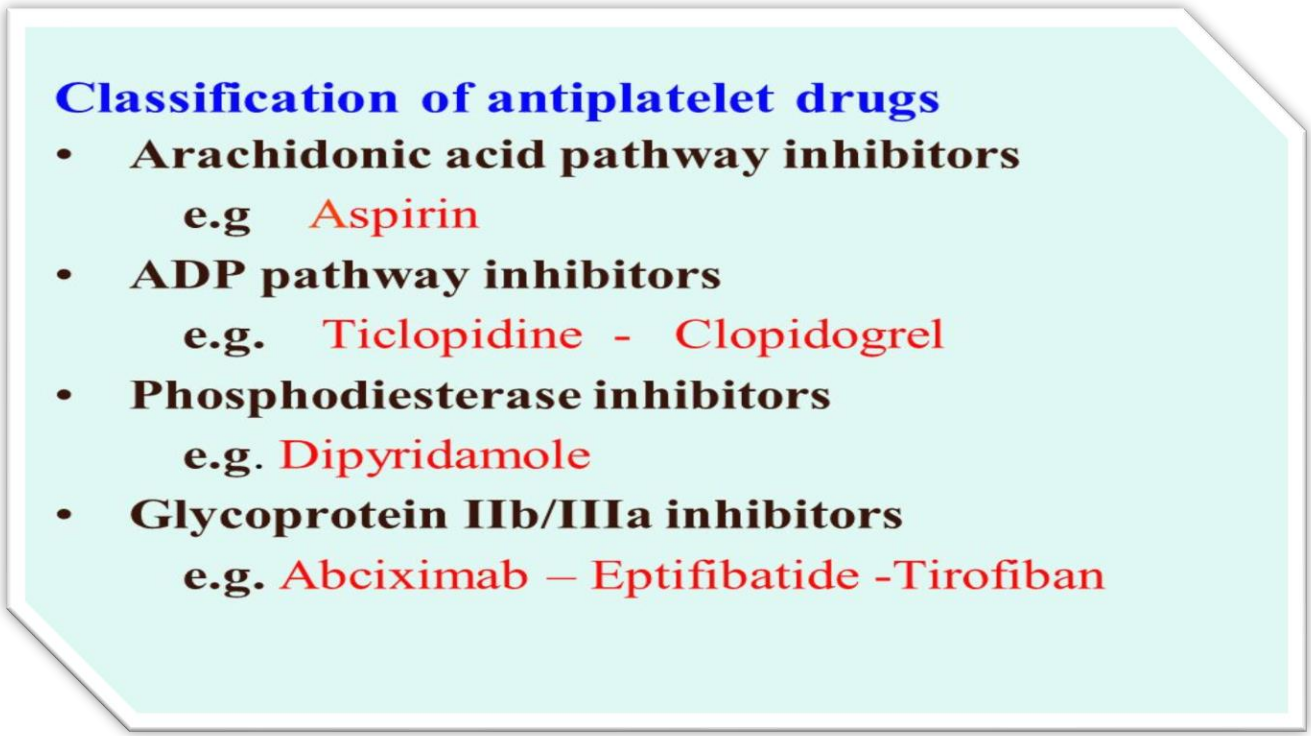
B. Direct Anticoagulants

1. Thrombin Inhibitors

- **Example**: Dabigatran
- **Indications**:
    - Prevention of stroke and systemic embolism in AF
    - Treatment of DVT and PE
- **Contraindications**:
    - Active bleeding
    - Mechanical heart valves (not recommended)
- **Notes**:
    - An antidote, idarucizumab, is available for emergency reversal.

2. Factor Xa Inhibitors

- **Examples**: Rivaroxaban, Apixaban, Edoxaban
- **Indications**:
    - Prevention of stroke in AF
    - Treatment and prevention of DVT and PE
- **Contraindications**:
    - Active bleeding
    - Severe renal impairment (especially caution for edoxaban)
- **Notes**:
    - Minimal monitoring required; however, should educate the patient about signs of bleeding.
    - Rivaroxaban is taken with food for effective absorption, while apixaban's timing is flexible



Classification of Antiplatelet Drugs

1. Arachidonic Acid Pathway Inhibitors

- **Example**: **Aspirin**
  - **Mechanism**: Inhibits cyclooxygenase-1 (COX-1), reducing thromboxane A2 production, which is essential for platelet aggregation.
  - **Indications**:
    - Primary and secondary prevention of cardiovascular events (e.g., myocardial infarction, stroke).
    - Acute coronary syndrome (ACS) management.
  - **Contraindications**:
    - Active gastrointestinal bleeding.
    - Severe hypersensitivity to aspirin or NSAIDs.
  - **Clinical Notes**:
    - Low-dose aspirin (75-100 mg daily) is effective for cardiovascular protection.

        - Patients may require gastroprotective agents to mitigate gastrointestinal side effects.

2. ADP Pathway Inhibitors

- **Examples**: **Clopidogrel, Ticlopidine**
    - **Mechanism**: Inhibit the P2Y12 receptor on platelets, preventing activation and aggregation.
    - **Indications**:
        - Clopidogrel: Used for secondary prevention of atherothrombotic events, ACS, and after PCI.
        - Ticlopidine: Less commonly used due to side effects; indicated for stroke prevention.
    - **Contraindications**:
        - Active bleeding.
        - History of hypersensitivity to the drug.
    - **Clinical Notes**:
        - Clopidogrel is a prodrug and may have variable efficacy due to genetic polymorphisms affecting metabolism.
        - Dual antiplatelet therapy (DAPT) with aspirin is often recommended after stent placement.

3. Phosphodiesterase Inhibitors

- **Example**: **Dipyridamole**
    - **Mechanism**: Inhibits phosphodiesterase, leading to increased levels of cyclic AMP in platelets, which inhibits aggregation.
    - **Indications**:
        - Used in combination with aspirin for secondary prevention of stroke.
        - May be used in patients with peripheral vascular disease.
    - **Contraindications**:
        - Active bleeding.
        - Severe hypotension or unstable angina.
    - **Clinical Notes**:
        - Often used in combination with aspirin for enhanced antiplatelet effect.

4. Glycoprotein IIb/IIIa Inhibitors

- **Examples**: **Abciximab, Eptifibatide, Tirofiban**
    - **Mechanism**: Block the glycoprotein IIb/IIIa receptor on activated platelets, preventing fibrinogen binding and platelet aggregation.
    - **Indications**:

        - Used in high-risk patients undergoing PCI and in ACS management.
    - **Contraindications**:
        - Active bleeding.
        - History of stroke or major surgery within the past 30 days.
    - **Clinical Notes**:
        - Abciximab has a longer duration of action and is typically used in a hospital setting.
        - Eptifibatide and tirofiban are shorter-acting and can be used in outpatient settings.

Classification of Thrombolytic Drugs

Generation of Thrombolytic Drug	Fibrin Specific	Non-Fibrin Specific
First Generation	--	Urokinase *
	--	Streptokinase *
Second Generation	Recombinant tissue plasminogen activator (t-PA) *	Pro-urokinase (scum-PA) *
	Alteplase	Sk-plasminogen activating complex (APSAC) *

Details of Thrombolytic Agents

1. First Generation Thrombolytics

- **Urokinase**:

    - **Mechanism**: Activates plasminogen to plasmin, leading to fibrin degradation.
    - **Indications**: Used for the treatment of pulmonary embolism and acute myocardial infarction.
    - **Notes**: Less fibrin-specific, which may lead to systemic fibrinolysis and increased bleeding risk.

- **Streptokinase**:
    - **Mechanism**: Forms a complex with plasminogen, converting it to plasmin.
    - **Indications**: Used in acute myocardial infarction and severe deep vein thrombosis.
    - **Notes**: Can induce allergic reactions; not fibrin-specific, leading to potential bleeding complications.

2. Second Generation Thrombolytics

- **Recombinant Tissue Plasminogen Activator (t-PA)**:
    - **Example**: **Alteplase**
    - **Mechanism**: Fibrin-specific; preferentially activates plasminogen bound to fibrin in clots.
    - **Indications**: First-line treatment for acute ischemic stroke, myocardial infarction, and massive pulmonary embolism.
    - **Notes**: Lower risk of systemic bleeding compared to first-generation agents.

- **Pro-Urokinase (scum-PA)**:
    - **Mechanism**: Similar to urokinase but with improved fibrin specificity.
    - **Indications**: Used in specific thrombotic conditions.

- **Sk-Plasminogen Activating Complex (APSAC)**:
    - **Mechanism**: A complex that activates plasminogen to plasmin.
    - **Indications**: Used in acute myocardial infarction.